REMARKS

This responds to the Office Action mailed on August 12, 2004.

No claims are amended, canceled, or added; as a result, claims 44, 45 and 60-83 are now pending in this application.

Information Disclosure Statement

Applicant respectfully requests that a copy of the 1449 Form, listing all references that were submitted with the Information Disclosure Statements filed on **August 28, 2001, September 5, 2003, and January 13, 2004**, marked as being considered and initialed by the Examiner, be returned with the next official communication.

§112 Rejection of the Claims

Claims 44-45 and 60-83 were rejected under the written description requirement of 35 USC § 112, first paragraph. The Office Action alleges that the claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant respectfully traverses this rejection.

The pending Office Action states on pages 2 and 3 that the specification has no support for the claimed feature of "*wherein a portion of the layer of titanium alloy remains in the bottom following the interaction*". Applicant notes that the Examiner does admit in the first paragraph on page 3 of the pending Office Action that "Applicant's interpretation of the disclosure is supported by the originally-filed specification" and points to the section of the specification on page 9, lines 12-14, which recites that "the titanium in the layer 16 of titanium or titanium alloy proximate to the silicon is converted to titanium silicide (TiSi, $TiSi_2$, Ti_3Si_5, or combinations thereof) to form the low resistance device contact 18". Applicant respectfully submits that there are numerous additional locations in the specification as originally filed that further support Applicant's claim language, and that one of ordinary skill in the art would understand that whether or not all of the titanium layer is absorbed into the silicide layer is a matter of the

thickness of the titanium layer, the annealing temperature and time, and the crystallographic state of the substrate at the time of the anneal. In other words, the presence or absence of a remaining layer of titanium or titanium alloy depends upon the overall process parameters chosen, and is under the control of the process operator.

In addition to the section of the specification indicated by the Examiner, page 9 lines 10-12, other locations in the specification that support Applicant's claim language include page 4 lines 6-7, which recite the present invention may be "an IC comprising a layer of a titanium alloy, coupled to a titanium silicide contact." At page 4 lines 10-11 state that the "I/O circuit comprise a layer of a titanium alloy coupled to titanium silicide contacts." Page 6 lines 2-3 recite that a "portion of the layer 16 is formed as a low resistance device contact". The claims as originally filed constitute a portion of the specification, and at least claims 10, 12, 18, 27, 34 and 35 may be read by one of ordinary skill in the art to include having a remaining portion of the titanium remaining over the silicide layer, depending upon the temperature and time of the anneal, among other processing factors.

In view of the above discussion Applicant respectfully requests that this rejection be reexamined and withdrawn.

§102 Rejection of the Claims

Claim 44 was rejected under 35 USC § 102(b) as being clearly anticipated by Anjum et al. (U.S. 5,401,674, cited in the IDS filed on May 17, 2004). Applicant respectfully traverses this rejection.

The cited reference of Anjum is seen as teaching a method for reducing the amount of silicon that is absorbed into a silicide growth region to prevent the very narrow diffused region from being substantially or entirely consumed. The method taught involves the ion implantation of germanium ions at 50 thousand volts acceleration and a very high dose of 0.5 to 1.0 X 10^{16} ions per cm^2, to a precise location below the mid-point of the titanium layer, to form a titanium germanide layer in the middle of the titanium layer that inhibits the growth of the titanium silicide layer. The titanium layer is formed by sputtering after the polysilicon gate electrodes are formed, and before any protective dielectric layers are formed, and before any contact holes are cut in the protective dielectric layers.

Applicant respectfully disagrees with the Office Action statement on page 3, second paragraph suggesting that the cited reference of Anjum "discloses a layer of titanium alloy covering the walls and bottom of a contact hole, see figures 2 and 3", and submits that an inspection of the cited reference's figure 8 would be more appropriate, since the processing at that time in the process actually has contact holes, which the figures 2 and 3 do not. As is apparent from Anjum's figure 8 and column 6, line 66 to column 7, line 9, there is no indication of any titanium layer covering the walls of the contact hole in the insulator layer 46. The only metal in the contact is the aluminum conductor 48, which contacts the titanium nitride/TiGe/ titanium silicide layer 24. The titanium silicide layer 24 clearly covers the bottom of the contact, but also covers the top surface of the active diffused area 20, and thus can not cover the walls of the contact, as required by some of the present claim language.

Specifically, Applicant submits that the cited reference does not contain all of the features found in independent claim 44, in particular at least the feature of "*a layer of a titanium alloy covering the walls and bottom of a contact hole* ", as recited in claim 44. Therefore, Applicant respectfully submits that the cited reference of Anjum does not contain all of the features of the present claimed invention, thus is not an appropriate anticipation reference, and this rejection should be reconsidered and withdrawn.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (508) 865-8211 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop AF, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 30th day of September, 2004.

Amy Moriarty
Name

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Signature